various changes and modifications may be made without departing from the scope of the invention as set forth in the appended claims.

What is claimed is:

1. A high-frequency waveguide, comprising:

a first high-frequency reflecting wall wherein dielectric bars of predetermined lengths, which respectively comprise a plurality of dielectric constant-different columnar bodies concentrically disposed so that their dielectric constants on the axial center sides thereof become low, are disposed in the form of plural layers so that the axial centers of the dielectric bars have planar regularities;

a second high-frequency reflecting wall which is opposite to the first high-frequency reflecting wall in parallel with a dielectric interposed therebetween and wherein dielectric bars of predetermined lengths, which comprise a plurality of dielectric constant-different columnar bodies concentrically disposed so that their dielectric constants on the axial center sides thereof become low, are disposed in the form of plural layers so that the centers of the dielectric bars have planar regularities; and

conductive plates which are opposite to each other with the end faces of the dielectric bodies constituting the first and second high-frequency reflecting walls being interposed therebetween and which are respectively connected to both end faces of the dielectric bars constituting the first and second high-frequency reflecting walls.

2. The high-frequency waveguide according to claim 1, wherein the dielectric bars are cylindrical.

3. The high-frequency waveguide according to claim 1, wherein the dielectric bars are hollow.

4. The high-frequency waveguide according to claim 2,

wherein the dielectric bars are hollow.

5. The high-frequency waveguide according to claim 1, wherein a dielectric lying between the first high-frequency reflecting wall and the second high-frequency reflecting wall is air.

6. The high-frequency waveguide according to claim 2, wherein a dielectric lying between the first high-frequency reflecting wall and the second high-frequency reflecting wall is air.

7. The high-frequency waveguide according to claims 1, wherein metal walls are further provided outside the dielectric bars corresponding to the outermost layers of the first and second high-frequency reflecting walls.

8. The high-frequency waveguide according to claims 2, wherein metal walls are further provided outside the dielectric bars corresponding to the outermost layers of the first and second high-frequency reflecting walls.

9. The high-frequency waveguide according to claims 3, wherein metal walls are further provided outside the dielectric bars corresponding to the outermost layers of the first and second high-frequency reflecting walls.

10. The high-frequency waveguide according to claims 4, wherein metal walls are further provided outside the dielectric bars corresponding to the outermost layers of the first and second high-frequency reflecting walls.

11. The high-frequency waveguide according to claims 5, wherein metal walls are further provided outside the dielectric bars corresponding to the outermost layers of the first and second high-frequency reflecting walls.

12. The high-frequency waveguide according to claims 6, wherein metal walls are further provided outside the dielectric bars corresponding to the outermost layers of the first and

second high-frequency reflecting walls.

13. The high-frequency waveguide according to claim 7, wherein the metal walls respectively comprise metal bar arrays in which metal bars identical in length to the dielectric bars are disposed along the dielectric bars.

14. The high-frequency waveguide according to claim 8, wherein the metal walls respectively comprise metal bar arrays in which metal bars identical in length to the dielectric bars are disposed along the dielectric bars.

15. The high-frequency waveguide according to claim 9, wherein the metal walls respectively comprise metal bar arrays in which metal bars identical in length to the dielectric bars are disposed along the dielectric bars.

16. The high-frequency waveguide according to claim 10, wherein the metal walls respectively comprise metal bar arrays in which metal bars identical in length to the dielectric bars are disposed along the dielectric bars.

17. The high-frequency waveguide according to claim 11, wherein the metal walls respectively comprise metal bar arrays in which metal bars identical in length to the dielectric bars are disposed along the dielectric bars.

18. The high-frequency waveguide according to claim 12, wherein the metal walls respectively comprise metal bar arrays in which metal bars identical in length to the dielectric bars are disposed along the dielectric bars.

19. A method of manufacturing a high-frequency waveguide, including the steps of:

laminating dielectric bars of predetermined lengths, comprising a plurality of dielectric constant-different columnar bodies concentrically disposed so that their dielectric constants become low on the axial center sides thereof, in the form of such plural layers that the centers of the dielectric

bars have planar regularities to thereby form first and second high-frequency reflecting walls; and

opposing the first and second high-frequency reflecting walls to each other in parallel, opposing conductive plates to each other with end faces of the dielectric bars constituting the first and second high-frequency reflecting walls being interposed therebetween, and connecting the conductive plates to both end faces of the dielectric bars constituting the first and second high-frequency walls respectively.

20. The method according to claim 19, further including a step of forming metal walls outside the dielectric bars corresponding to the outermost layers of the first and second high-frequency reflecting walls.